REMARKS

In the Office Action mailed May 29, 2003, claims 1, 5, 7, 8-14 were rejected under 35 USC 102(b) as being anticipated by Lyon (U.S. Patent 5,675,665), claim 2 was rejected under 35 USC 103(a) as being unpatentable over Lyon, and claims 3, 4, and 6 were rejected under 35 USC 103(a) as being unpatentable over Lyon in view of Tsuruoka et al. (Handwritten "KANJI" and "HIRAGANA" Character Recognition Using Weighted Direction Index Histogram Method). The foregoing rejections are respectfully traversed.

In accordance with the foregoing, claims 1 and 6-14 have been amended. Claim 5 has been cancelled. Claims 1-4 and 6-14 are pending and under consideration. Claims 1 and 9-14 are independent claims. Claims 2-4 and 6-8 depend either directly or indirectly from claim 1.

Care has been exercised to avoid the introduction of new matter.

Lyon relates to the division of a word, the extraction of a character from the word, and the recognition of the character. Moreover, Lyon performs character recognitions over characters extracted from a recognition target for the purposes of generating bounds model pairs to which the recognition target is compared. That is, in the Lyon system, a recognition target corresponding to a plurality of radicals or characters is separated into parts each corresponding to a character unit for generating a bounds measurement pair of the recognition target. In the Lyon system, it is impossible to generate a bounds measurement pair without separating a recognition target into parts each corresponding to a character unit.

Figures 14-16, and col. 20 at lines 34-62, of Lyon discloses that each Chinese ideograph shown in Figures 14-16 is divided into radicals, and that each radical is recognized by the recognition unit 22 in much the same way that characters are recognized (refer to Lyon, col. 20 at lines 34-62). That is, the Lyon apparatus/method divides the ideographs into radicals, recognizes the radicals and from that recognition, recognizes the ideograph.

Tsuruoka discloses a weighted direction index histogram method. The process associated with Tsuruoka et al. as shown in Fig. 3(b) and Fig. 4(b) involves the use of a two-dimensional Gaussian filter. More particularly, lines 13-14 in section 2.3 Realization, of Tsuruoka et al. reads "these sets of values given as weighting factors of filters respectively are in accordance to the 2-dimension space Gaussian distribution". Therefore, the foregoing section of Tsuruoka et al. indicates that in the Tsurouka apparatus, gradating conversion is

performed in same direction as character connecting.

The combination, therefore, of Lyon and Tsuruoka is an apparatus which performs character recognition over characters extracted from a recognition target for the purposes of generating bounds model pairs to which the recognition target is compared, using a weighted direction index histogram method, and in which the bounds measurement pair must be generated by separating a recognition target into parts each corresponding to a character unit.

In contrast to the foregoing references relied upon, and as recited in claims 1 and 9-14, the present invention includes the feature that a feature amount of a word can be generated by using a composition operation and a feature amount meeting the following condition:

Condition: A feature amount extracted from a word matches a feature amount obtained by combining the respective feature amounts extracted from a plurality of characters composing the word, using the composition operation.

That is, each of claims 1 and 9-14 recites (using the recitation of claim 1 as an example) "a generating unit referring to the list of at least one candidate word stored in said listing unit, and dynamically generating a feature amount of only a candidate word registered in the list by a composition operation using the feature amounts of characters stored in said dictionary unit during a recognition process for the recognition target, the feature amounts of the word and characters and the composition operation determined such that the feature amount of the word generated by the composition operation matches a feature amount extracted from the word by said extracting unit"

Also in contrast to the foregoing references relied upon, claim 7 of the present application recites that the collating unit performs "a non-linear matching of the feature amount of the word and the feature amount of the recognition target such that a shift of the recognition target in a connection direction of characters is absorbed". Advantageously, with the features of claim 7, in the present invention, non-linear matching is applied in such a way as to absorb the shift of a recognition target in a connection direction of characters.

Additionally in contrast to the foregoing references relied upon, claim 8 of the present application recites "said listing unit stores a plurality of lists of candidate words, and wherein said generating unit selects a list which has a high possibility of containing a word corresponding to the recognition target from among the plurality of lists according to a previous

recognition result and refers to the selected list". Advantageously, with the features of claim 8, the present invention selects one word list from a plurality of word lists, based on the previous recognition result.

The Examiner asserts in the Office Action that there is no need to divide an ideograph "forest" in order to recognize the ideograph "forest" shown in Fig. 14 of Lyon. However, the bounds model pair 104 shown in Fig. 16 corresponds to the feature amount of a model provided in advance, and is generated from the feature amount of "wood". In this case, since the feature amount of "wood". is provided in advance, there is no need to divide the ideograph "forest".

However, if an image of an ideograph "forest" is inputted as a recognition target, the image to be recognized must be divided into units in order to generate the bounds measurement pair 94 shown in Fig. 15 that can be collated with the bounds model pair 104 shown in Fig. 16.

Thus, the feature amount of a recognition target is different than the feature amount of a model in Figs. 14 through 16.

In contrast to the foregoing references relied upon, the present invention extracts the feature amount of a recognition target by a process requiring no unit division even if the recognition target is composed of a plurality of units. In order to enable such an extraction process, the feature amounts and the composition operation described above are used.

Withdrawal of the foregoing rejections is respectfully requested.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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Date: August 28, 2003

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